Geographic Data Service Center

TRAINING CATALOG
FISCAL YEAR 2000

United States Department of the Interior
Bureau of Indian Affairs
Office of Trust Responsibilities

Table Of Contents

Introduction and Overview of the GDSC Training Program

As the primary provider of geo-processing technology training in Indian Country, the Geographic Data Service Center (GDSC) is pleased to provide this FY 2000 Training Catalog. The GDSC maintains a training facility supported by a professional teaching staff at its facility in Lakewood, Colorado. Training is available to both Tribal and BIA personnel. While there is no tuition for the training, students must furnish their own transportation, meals, and lodging when attending training at the GDSC. Training courses at the GDSC are presented on PCs running Microsoft Windows NT.

This catalog describes the five formal training courses, as offered by the GDSC. A suggested training path is indicated by the prerequisites and overview of each class (detailed later in this catalog).

Training Courses

The five formal courses offered by the GDSC are as follows:

1) "**Introduction to ArcView GIS**"
2) "**Intermediate ArcView**"
3) "**Working with ArcView Spatial Analyst**"
4) "**GIS Data Entry with Global Positioning Systems (GPS)**"
5) **"Basic and Advanced PLGR Operation"**

The 2-day ESRI Authorized **"Introduction to ArcView GIS"** course is offered five times per year at the GDSC. This course serves as the "entry level" GIS course offered by the GDSC. The course provides a conceptual overview and hands-on experience using ArcView GIS software.

The 2.5-day **"Intermediate ArcView"** course is offered two times per year at the GDSC. This course serves as the "second level" ArcView GIS course offered by the GDSC. Topics covered include using extensions & scripts, customizing the ArcView interface, data conversion, & more.

The 3-day ESRI Authorized **"Working with ArcView Spatial Analyst"** course is offered one time per year at the GDSC. This course serves as the "highest level" GIS course offered by the GDSC. This three-day course explores how the ArcView Spatial Analyst uses raster and vector data in an integrated environment.

The 3.5-day **"GIS Data Entry with Global Positioning Systems (GPS)"** course is offered four times per year at the GDSC. This course reviews the preparation for and collection of GPS data, as well as the conversion of that data to GIS datasets.

The 3-day **Basic and Advanced PLGR (Precise Lightweight GPS Receiver)** course is offered one time each year at the GDSC. This course is offered in two parts: a two-day basic course and a one-day advanced course, held back-to-back. The first portion of the course reviews basic operation of the PLGR receiver, its special security requirements and its applications in navigation and mapping data collection. The advanced portion of the course reviews using the PLGR with Differential GPS, laser range finders, the survey mode of the PLGR and moving data from the PLGR to ArcView, PowerMap and other mapping packages. **Note: Students must possess and bring a PLGR to the class. PLGR ownership is limited to Full-time Federal Employees only.**

Training Courses
Presented at the GDSC

(Details, Schedules, and Registration Information)

Training courses presented at the BIA Geographic Data Service Center (GDSC) are available free-of-charge to Tribal and Bureau personnel. Students attending courses and workshops at the GDSC, however, must furnish their own transportation, meals, and lodging.

How to Register for a Course Presented at the GDSC

STEP 1: Complete the GDSC Training Registration Form

Qualified individuals wishing to attend courses at the GDSC must submit a *GDSC Training Registration Form* (page 8). Each applicant must submit an individual application for each separate course being requested; single registration forms completed for more than one person will not be accepted. Please photocopy the registration form on page 8 as needed. **The GDSC Training Schedule & GDSC Training Registration form are also available on the Internet at** http://www.gdsc.bia.gov

Fill out the *GDSC Training Registration Form* completely and return it to the GDSC. While you may FAX a completed form to the GDSC Training Coordinator (303/231-5122), you must also mail an original copy of the form to the GDSC. The GDSC's phone and FAX numbers and mailing address are printed at the top of the *GDSC Training Registration Form*. When filling out this form, please follow these instructions:

1) Place a check mark beside the title of the course you wish to attend. **(Note: Please register for only one course per registration form.)**

2) Indicate a "Primary Date" for the course you wish to attend or the workshop you are requesting. **(Note: The "2000 GDSC Training Schedule" on page 7 of this catalog lists GDSC course dates)**

3) Indicate a "First Alternative" (i.e., secondary date) for the course you wish to attend or the workshop you are requesting.

4) Provide your name, organization, full address, and telephone/FAX numbers. Have your Supervisor sign the form.

5) List in detail any previous computer or GIS training experience that you have had.

6) Provide information about:
   - Types of computer(s) at your work site.
   - Software (specifically, GIS software) at your work site.
   - Database software (e.g., ORACLE, Access, etc...) at your work site.

Please Note:

Courses presented at the GDSC frequently fill far in advance, so submit your registration as early as possible to insure your enrollment.

STEP 2: Submit an Completed Registration Form to the GDSC

Submit completed *GDSC Training Registration Form* to the following address:

Chief, (Attention: Training Coordinator)
BIA-GDSC
3000 Youngfield Street, Suite 230
Lakewood, Colorado 80215

To FAX a copy of this form to the GDSC, use the following phone number:

FAX: (303) 231-5122

Note: If you FAX in a registration form, you must also mail the original copy of the form to the GDSC. Registration priority for courses is based on the date of FAX receipt or the date of mail postmark (whichever is earlier).

STEP 3: Confirmation of Course or Workshop Registration

Course Registration Confirmation

Students registered for courses will receive written notification of their registration 3-4 weeks prior to the class start date. Students will also receive information regarding lodging accommodations, as well as shuttle services to/from Denver International Airport (DIA). Lodging and shuttle information is also available on the GDSC Home Page (http://www.gdsc.bia.gov/about.htm).

If the primary date requested for a course is filled when GDSC Training Staff receive a registration form, enrollment is made for the "first alternative" (i.e., secondary) course date requested. If courses on both the primary and first alternative requested dates are filled, the individual making the registration request will be contacted about further alternatives.

Note: If you are registered for a course and discover that you cannot attend, please notify the GDSC Training Coordinator as soon as possible so that someone on the course waiting list may take your place. Students who fail to show up for a class will be denied registration for future classes.

You may call the GDSC (303/231-5100) at any time to verify, cancel, or alter registration in a course.

2000 GDSC Training Schedule

All classes listed below will be taught at the Geographic Data Service Center in Lakewood, Colorado. Submit a *GDSC Training Registration Form* (page 8) as early as possible to obtain enrollment for the primary course date requested.

Introduction to ArcView GIS

October 19 – 20, 1999
November 16 - 17, 1999
February 15 - 16, 2000
June 20 - 21, 2000
August 22 – 23, 2000

Intermediate ArcView

April 18 – 20, 2000
September 19 – 21, 2000

Working with ArcView Spatial Analyst

March 28 – 30, 2000
May 16 – 18, 2000

GIS Data Entry with Global Positioning System (GPS)

March 14 – 17, 2000
May 2 – 5, 2000
July 18 – 21, 2000
September 11 – 14, 2000

Basic and Advanced PLGR Operation (Limited to Full-time Federal Employees)

March 7 – 9, 2000

GDSC Training Registration Form

RETURN TO :

Chief, (Attention: Training Coordinator)
Bureau of Indian Affairs
Geographic Data Service Center
3000 Youngfield Street, Suite 230
Lakewood, CO 80215

FAX: (303) 231-5122
PHONE : (303) 231-5100

Please indicate which course you wish to attend:

____Introduction to ArcView GIS
____Intermediate ArcView
____Working with ArcView Spatial Analyst
____GIS Data Entry with Global Positioning System (GPS)
____Basic and Advanced PLGR Operation

Please indicate the date of the course or workshop you wish to attend:

Primary date _____
First Alternative_____

Student Information:

Name: _____
Organization:
_____
Address: _____
City, State, Zip: _____
E-Mail: _____
Phone: _____FAX:_____

Previous computer or GIS training : _____
_____
Supervisor's Name (Please Print) _____
Supervisor's Signature for Approval _____

Cancellation Policy: If you are not going to be able to attend a class for which you are registered, the GDSC Training Coordinator **must** receive your cancellation a minimum of ONE (1) week before the start of the class for which you are registered. Failure to give adequate notice of cancellation may result in the denial of your registration for other classes!

Site Information:

Computer at your site:_____
Software at your site:_____
Database at your site:_____

Course Descriptions

Introduction to ArcView GIS

OVERVIEW This course provides an introduction to the concepts, benefits, and functionality of ArcView Geographic Information Systems. A PowerPoint™ lecture will accompany hands-on student experience to properly enable the student new to the GIS environment to understand the fundamentals of the discipline.

DURATION 2 Days

AUDIENCE Intended for BIA and Tribal personnel interested in gaining a basic knowledge of ArcView and the components that constitute its environment

CLASS SIZE Limited to 10 students
(Note: While more than ten students can be accommodated if necessary by sharing computers, registration of more than ten students for this course is at the discretion of GDSC management and training staff)

PREREQUISITES · **Preliminary** skills using a PC or UNIX workstation, Microsoft Windows or command-line UNIX operations, and standard applications (i.e., word processor, spread sheet, database, etc.)

FORMAT Lecture combined with hands-on exercises

MATERIALS Participants are furnished a course training manual, as well as all course data on CD-ROM.

OBJECTIVES Upon completion, students will:

- Attain a perception of how geography associates with (and is an important component of) ArcView GIS
- Understand the basic capability and functionality of the popular GIS tool, "ArcView" software
- Develop the ability to perform important GIS functions such as queries (tabular and/or spatial), editing, analysis, data creation, and more.

Introduction to ArcView GIS
Course Syllabus

Course Objective:
This course provides participants with an understanding of ArcView concepts, components, processes, functionality, and terminology. Participants are also taught to use ArcView to display map and tabular data, as well as use ArcView to update and analyze geographic data. If the class progresses quickly, two extra topics ("Creating themes from route measures", and "Displaying image themes") will be covered.

Course Topics:

- ArcView Basics
  - What is ArcView GIS?
  - Exploring the ArcView interface
- Getting data into ArcView
  - Creating views and themes
  - Referencing views to the real world
- Displaying themes
  - Thematic mapping with the Legend Editor
  - Choosing a classification method
  - Modifying legend elements
  - Managing theme display with Theme Properties
- Working with tables
  - Using ArcView tables
  - Querying tables
  - Building relationships between tables
  - Creating charts from tables
- Creating and editing shapefiles
  - Working with shapefiles
  - Creating a new shapefile
  - Editing shapefiles
- Querying and analyzing themes
  - Analyzing spatial relationships
  - Performing spatial join and spatial merge
- Geocoding addresses
  - What is address geocoding?
- Creating layouts
  - What is a layout
  - Defining frames
  - Adding graphics
  - Printing a layout
- What comes next
  - Software training, and help

Intermediate ArcView

OVERVIEW This new two-day course created by the GDSC offers the more experienced ArcView users in-depth instruction in the software's ability to integrate geographic information. Students move beyond the basics as they perform GIS analysis using the software's total functionality including new geoprocessing tools. The course also helps students become more productive ArcView users by teaching them advanced topics such as using sample scripts and extensions, converting themes into new map projections, and making projects portable.

DURATION 2.5 days

AUDIENCE Intended for BIA and Tribal personnel interested in gaining more in-depth knowledge of ArcView GIS and moving into more complex GIS topics.

CLASS SIZE Limited to 10 students
(Note: While more than ten students can be accommodated if necessary by sharing computers, registration of more than ten students for this course is at the discretion of GDSC management and training staff)

PREREQUISITES Certificate holder of "Introduction to ArcView GIS" course and 3 months experience using ArcView GIS or possessing a similar equivalent experience.

FORMAT Lecture combined with hands-on exercises

MATERIALS Participants are furnished a course training manual, as well as supplemental class notes and documentation (as required).

OBJECTIVES Upon completion, students will understand:

- The *management* of data
- Creating *portable* and *custom* projects
- Obtaining *external* spatial and tabular data
- Professional presentation of data using *layouts* & *reports*
- Accessing and using scripts and extensions
- Customizing the GUI for individual needs
- Performing advanced spatial functions (intersect, clip, merge, union, etc.)

Intermediate ArcView

Course Syllabus

Course Objective:

This course provides participants with a value-added understanding of ArcView functionality that goes beyond the basics. Upon completion of the course, students will be able to perform ArcView GIS operations with more capability and confidence when dealing with complex data sets, external data types, and advanced analytical needs.

NOTE

Because all classes progress at different rates and the training time is limited, the GDSC reserves the right to modify the following topics as needed for each individual class.

Course Topics:

- Exploring Data Management
  - Using the Internet to access data and tools
  - Converting different data types
  - Aligning data by modifying projections or Datums
  - Moving, renaming or deleting source data
  - Working with CAD data.

- Using scripts, customization, and extensions
  - Installing scripts and extensions.
  - Customizing a project's GUI
  - Accessing sample scripts and extensions via the Internet
  - Installing, cutting, and pasting existing Avenue scripts.
  - Testing new scripts and extensions
  - Custom Icons for new sample scripts.
  - Looking at the ArcView Spatial Analyst. extension

- Working with projects
  - Editing projects
  - Using the Port Project Utility
  - What are portable projects
  - Custom projects for others

- Data presentation using layouts and reports
  - Basic construction of a report using Crystal Reports
  - Cartographic concerns when creating a professional layout

- Geoprocessing
  - Using the Dissolve feature
  - Using the Spatial Join function
  - Using the Clip function
  - Using the Merge function
  - Using the Union function
  - Using other spatial functions

Working with the ArcView Spatial Analyst

OVERVIEW This three-day course explores how the ArcView Spatial Analyst extension uses raster and vector data in an integrated environment. The course teaches basic raster concepts and introduces GIS models. It emphasizes problems that are best solved in a raster environment such as surface analysis and distance measurement.

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DURATION 3 days

AUDIENCE Intended for BIA and Tribal personnel interested in gaining knowledge of modeling, raster analysis, and the power of raster data.

CLASS SIZE Limited to 10 students
(Note: While more than ten students can be accommodated if necessary by sharing computers, registration of more than ten students for this course is at the discretion of GDSC management and training staff)

PREREQUISITES Completion of "Introduction to ArcView GIS", GDSC "Intermediate ArcView" course, and 4 months direct ArcView experience, or equivalent experience is required.

FORMAT Lecture combined with hands-on exercises

MATERIALS Participants are furnished a course training manual, as well as training data used in the course on CD-ROM.

OBJECTIVES Upon completion, students will be able to:

- Apply the grid data model
- Access the ArcView Spatial Analyst extension
- Convert data to grid format
- Manage grids
- Implement map algebra functions
- Use ArcView Spatial Analyst for distance modeling
- Create continuous surfaces
- Perform surface hydrology functions
- Apply basic modeling concepts
- Implement models

Working with the ArcView Spatial Analyst
Course Syllabus

Course Objective:

Participants are shown how to use the raster tools in ArcView Spatial Analyst and learn how to convert between feature-based and grid-based themes. They also access such additional functionality as cost/distance analysis and hydrologic analysis by issuing Avenue requests with the Map Calculator.

Course Topics:

Basics of ArcView Spatial Analyst:
- ArcView Spatial Analyst extension
- Understanding raster concepts
- ArcView Spatial Analyst interface

Grids:
- Comparing grid themes and feature themes
- Querying grid themes

Structure of grid themes:
- How to create grids
- Grid storage and management

Aligning themes:
- Grid registration and georeferencing
- How projection affects analysis
- Importing and exporting grids

Conducting surface analyses:
- Calculating density
- Choosing an interpolation method
- Interpolating a continuous grid from sample points
- Contours and hillshading
- Visibility analysis

Issuing Avenue requests from the GUI:
- Map algebra functions
- Writing expressions
- Expression syntax
- Avenue request rules and help

Calculating distance measurements:
- Euclidean distance
- Cost distance
- Finding the least-cost path

Surface hydrology:
- Identifying watershed basins
- Determining surface runoff characteristics

Designing and implementing GIS models:
- Identifying issues
- Understanding measures and weights
- Utility scales
- Model implementation

GIS Data Entry with Global Positioning Systems (GPS)

OVERVIEW This course introduces participants to the system components (hardware and software) used by the BIA for automated collection of position and attribute data using GPS in the field. Subsequent differential correction, data conversion, and import into a GIS are also reviewed. The course objective is to teach participants to plan GPS data collection, configure the collection system, acquire data, and enter these data into a GIS.

DURATION 3.5 days

AUDIENCE Tribal and BIA personnel needing to use GPS to collect geographic and attribute data for their GIS.

CLASS SIZE Limited to 8 students

PREREQUISITES
- Students **must** have computer hardware capable of running GPS software and a geographic database for their reservation
- Completion of "Introduction to GIS using ArcView" or 6 months hands-on experience with ARC/INFO

FORMAT Lectures, discussions, and hands-on field data collection exercises

MATERIALS All students receive their own copy of course notes, including exercises

OBJECTIVES Upon completion, participants will be able to:
- Perform GPS project planning
- Perform hardware setup
- Collect GPS data
- Enter the GPS data into their GIS
- Edit the GPS/GIS data

GIS Data Entry with Global Positioning System (GPS)
Course Syllabus

Course Objective:
This course introduces participants to the use of Global Positioning System (GPS) hardware and software for planning, acquiring, post processing, and updating GIS coverages. Concepts of GPS are demonstrated and developed by hands-on use of the GDSC's GPS and GIS computing environment.

Schedule for the Week:
- Tuesday: Setup / Concepts / Configurations
  (menus specific to the configuration available at the site will be used)
- Wednesday: Planning, GPS data collection, differential correction, GIS entry
- Thursday: Planning, GPS data collection, differential correction, GIS entry
- Friday: Discussions / Packing

Course Topics:
- GPS Overview
  - Components and Terminology
  - Configurations / Accuracy's
  - Current costs / Capabilities
- GPS Planning
- Data Dictionaries
- GPS Data Collection
- GPS Post Processing
- GPS Export for GIS
- GPS Real-time Collections
- Field Navigation

Basic and Advanced PLGR Operation

OVERVIEW The 3-day PLGR (Precise Lightweight GPS Receiver) course has two parts, a two-day basic course and a one-day advanced course, held back-to-back. The basic portion of the course reviews basic operation of the PLGR receiver, its special security requirements and its applications in navigation and mapping data collection. The advanced portion of the course reviews using the PLGR with Differential GPS, laser range finders, the survey mode of the PLGR and moving data from the PLGR to ArcView, PowerMap and other mapping packages.

The course is taught one time per year. Workshops can be arranged with the instructor in special circumstances.

DURATION 3 days (Tuesday - Thursday)

AUDIENCE Full time Federal employees who possess PLGR receivers and need to learn how to get the most utility from the receivers.

CLASS SIZE Limited to 2 students per PLGR and PC (this limits the class to 8 students)

PREREQUISITES
- **Students must possess a PLGR (or have an order in place for a PLGR) to attend this course**
- **PLGR use is limited to Full-time Federal employees only**

FORMAT Lectures, discussions and hands-on field data collection exercises
Note: Much of this course is conducted outside. Denver weather is unpredictable, bring clothes for rain, snow and shine.

MATERIALS All students receive their own copy of the course notes and training manual

OBJECTIVES Upon completion of this course the student will be able to:
- Describe the security requirements of the PLGR
- Use all of the basic functions of the PLGR
- Effectively manage datasets in the PLGR
- Move datasets to ASCII and ArcView

Basic and Advanced PLGR Operation
Course Syllabus

Course Objective:
This course introduces participants to the use of the PLGR for navigation and data collection. Participants will learn GPS concepts and PLGR operation through lecture and hands-on use of the PLGR. Participants must attend the Basic Course before attending the Advanced Course. Participants can attend a Basic course during one session, then attend the Advanced Course at a later date.

Notes: Much of this course is conducted outside, rain, snow or shine. Wear (bring) appropriate outdoor clothing.

Schedule for the Week:
- Basic Course
  - Tuesday: GPS Overview and Concepts/PLGR History and Security/PLGR Overview
  - Wednesday: Basic Navigation and Data Collection with PLGR

- Advanced Course
  - Thursday: Advanced Navigation and Data collection with PLGR; Moving PLGR data to GIS and other Software, Evaluation

Course Topics:
- Basic Course -
  - GPS Overview
  - PLGR History and Security, PPS vs. SPS.
  - PLGR Maintenance and Setup
  - Positioning
  - MARKing Points
  - Automarking
  - Averaging Points
  - Man Over Board
  - ASCII out and Data transfer
  - Basic Navigation and Routes
  - Area Calculation
  - Hot keys

- Advanced Course -
  - ADDS Survey Function
  - Remote Positioning
  - Alerts and Auto Leg Advance
  - Differential Correction
  - Laser Range Finder
  - Software Applications, (MPS, TrackPlan, PowerMap, ArcView, Tracking Analyst),
  - Course Evaluation

GDSC Help Desk

303-231-5120

7:30 AM to 4:30 PM MT

Monday through Friday

Email to: gdsc@gdsc.bia.gov

Webpage: http://www.gdsc.bia.gov

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